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# Primary Care in an Underserved Rural Area: the Goodlark Experience in Middle Tennessee

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## SYNOPSIS .....

*With the assistance of Federal funding and three National Health Service Corps physicians, the Goodlark Rural Health Care System was established during the first 8 months of 1979 in a four-county, medically underserved area of Middle Tennessee. Four primary care clinics and a health screening and weight reduction clinic were initiated, and efforts were made to make the clinics responsive to community needs and complementary to existing area resources.*

*A study of the results of these efforts through December 1981 showed that community acceptance, measured by patients' use of the clinics and satisfac-*

*tion with the services provided, was generally high; however, one of the small primary care clinics was closed after 1 year because of a continuing decline in patient visits. Many patients continued to follow former patterns of reliance on larger centers for specialized care (and occasionally primary care), using the Goodlark clinics primarily for convenience.*

*The primary care clinic that provided the most comprehensive services and that represented an expansion of an area physician's family practice showed a continuing increase in the number of new- and return-patient visits during the period of the study. Indeed, this clinic generated revenue sufficient to support the remaining clinics in the system, allowing Federal funding to be discontinued. The health screening and weight reduction clinic, however, met with poor community response.*

*Acceptance of nurse practitioners by patients of the primary care clinics was high, and the Goodlark experience suggests that these practitioners may be the most cost-effective providers of primary care in more sparsely populated areas.*

*Innovations in health planning must take into consideration local community factors and previous patterns of health care in order to complement existing health resources. Findings with respect to the Goodlark experience may be worthy of consideration by health planners in other localities.*

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**N**ATIONWIDE, RURAL POVERTY is more prevalent than urban poverty: 17 percent of the rural population has income below the Federal poverty level, compared with 10.2 percent of the urban population. Physician-to-patient ratios also show a rural disadvantage—1:1,562 for rural areas, but 1:641 for urban ones (1). U.S. hospitals, with an average of 6.2 beds per 1,000 patients (2), remain concentrated in metropolitan areas.

Emphasis on primary health care and efforts to compensate for maldistribution of physicians are of particular importance to the people of the largely rural Middle Tennessee area. Despite the introduction of several new physicians into the area over the past few years, it remains substantially below the national norm in health resources, and some Middle Tennessee counties are among the least fortunate in

the nation with respect to physician-to-patient ratios. Moreover, the area's rural population grew 30 percent between 1970 and 1980 (3) and contains a significant share of rural inhabitants whose income falls below the Federal poverty level (4). Population totals, percentages of the population below the poverty level, physician-to-patient ratios, and number of hospital beds per 1,000 population for 11 counties of Middle Tennessee are shown in table 1.

During an 8-month period in 1979, the Goodlark Rural Health Care System opened four primary health care clinics and a health screening and weight reduction clinic in a four-county area of Middle Tennessee (fig. 1). The clinics were launched with a Federal Rural Health Initiative grant; community support; the direction of a nine-member citizen board, constituted under Federal guidelines; and the

Table 1. Population and health resources of 11 Middle Tennessee counties

County	Population <sup>1</sup>	Percent of population below Federal poverty level <sup>2</sup>	Physician to patient ratio	Hospital beds per 1,000 population
Cheatham	21,616	15.4	1:5,404	0
Davidson	477,811	10.4	1:834	13.4
Dickson	30,037	16.3	1:1,877	4.7
Hickman	15,151	23.9	1:5,050	2.7
Houston	6,871	25.4	1:1,374	7.2
Humphreys	15,957	19.7	1:1,773	3.3
Montgomery	83,342	18.4	1:1,938	2.5
Perry	6,111	27.4	1:3,055	4.7
Robertson	37,021	19.5	1:3,085	3.8
Stewart	8,665	29.5	1:8,665	0
Williamson	58,108	14.4	1:3,632	2.2

<sup>1</sup> SOURCE: Reference 3

<sup>2</sup> SOURCE: Reference 4

assistance of three National Health Service Corps physicians. This paper reports on experience with the Goodlark system from January 1979, when the first two clinics were opened, through December 1981.

### The Goodlark System

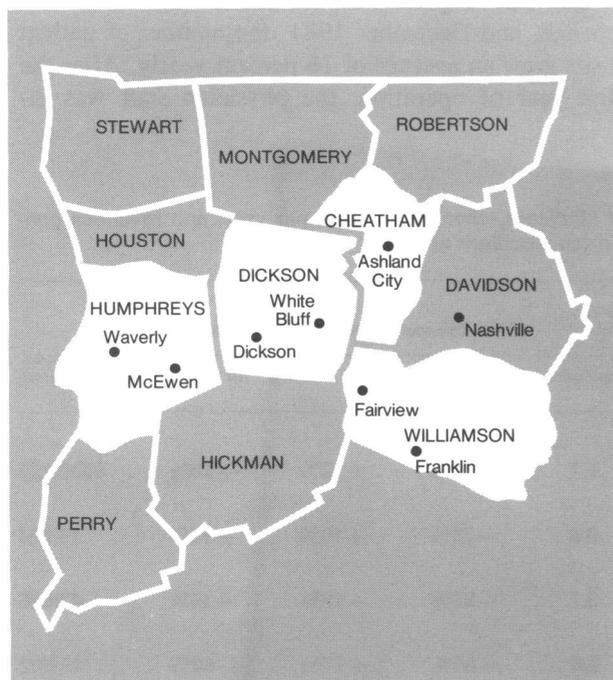
The Goodlark Rural Health Care System initially comprised the Cheatham Health Care Center (Cheat-

ham County), the McEwen Clinic (Humphreys County), the White Bluff and Dickson Clinics (Dickson County), and the Fairview Clinic (Williamson County). The Fairview Clinic closed in December 1979, for reasons that will be explained later in this paper.

Health care in the Goodlark system is provided by four physicians and three nurse practitioners. Visits by patients to the primary care clinics (Dickson is for health screening and weight reduction only) are made for a wide range of services, excluding obstetrical and hospital care. Goodlark Hospital in the town of Dickson, with 16 physicians and a 140-bed hospital, serves as the secondary care referral center, and a medical transportation service to the hospital is provided. Referrals to other area hospitals are also made, according to patients' preferences.

Clinic fees are based on a sliding scale, in accordance with Federal guidelines. A nonappointment registration system is observed for all patients.

Figure 1. The four-county area served by the Goodlark Rural Health Care System, shown within 11 counties of Middle Tennessee



**The Goodlark clinics.** Cheatham Health Care Center was opened in August 1979 in Ashland City (population 2,400), 20 miles northwest of Nashville and 30 miles northeast of Dickson. This clinic is the major source of medical care for Cheatham County. The clinic has seven examination rooms and full laboratory and X-ray facilities. It is open 68 hours per week and is staffed by three physicians, a family nurse practitioner, a laboratory and X-ray technician, receptionists, and office assistants. This center represents an expansion of a solo physician's family practice, the physician having been retained and his facility modernized.

McEwen Clinic, opened in May 1979, is located in the town of McEwen (population 1,200), 10 miles east of Waverly (which has nine physicians and a 52-bed hospital) and 15 miles southwest of Dickson. The McEwen Clinic has two examination rooms and basic laboratory capability. It is staffed 20 hours per week by a family nurse practitioner and a receptionist-office assistant and is visited by a physician every 2 weeks.

White Bluff Clinic, opened in January 1979, is located in the town of White Bluff (population 1,800), 10 miles northeast of Dickson and 25 miles southwest of Nashville. This clinic, which also has two examination rooms and basic laboratory capability, is staffed 20 hours per week by a physician and a family nurse practitioner who alternate coverage (12 hours for the nurse practitioner, 8 hours for the physician), a receptionist, and an office assistant.

Fairview Clinic, which operated from January to December 1979, was located in the town of Fairview (population 2,000), 15 miles southeast of Dickson, 20 miles southwest of Nashville, and 10 miles northwest of Franklin (which has 16 physicians and a 125-bed hospital). Like McEwen and White Bluff clinics, Fairview had two examination rooms and basic laboratory capability. Open 40 hours per week, it was staffed by a physician and a receptionist-office assistant. The facility was shared with a State health department clinic that operated during hours when the Fairview Clinic was closed.

Dickson Clinic opened in July 1979 at the central Goodlark system office in Dickson. This clinic staffed by two nurse practitioners provides diet and weight reduction counseling services. It also offers the

Health Evaluation and Reassurance Test, a screening battery available to local businesses and individuals and consisting of a self-administered computer history, complete blood count and blood chemistries, urine analysis, electrocardiogram, pure-tone audiogram, visual acuity test, air pressure tonometry, tine test, screening spirometry, stool examination for occult blood, and measurement of height, weight, and blood pressure.

### Data Collected

A centralized, computerized, cross-referenced patient report and health care provider procedure analysis is used by the Goodlark health network. The system was used in the preparation of this report to generate retrospective data on the number of patients registered at each clinic, the number of new- and return-patient visits, the percentage of patients using Medicare and Medicaid, health care provider activity, and revenues generated by the clinics. Data for the four primary care clinics are summarized in table 2.

By the end of December 1981, Cheatham Health Care Center had registered 11,744 patients, of whom 5 percent were on Medicaid and 4.1 percent were on Medicare. An average of 280 new and return patients were being seen in the clinic each week—some 30 of them by the nurse practitioner, whose services generated revenues approximately equal to her salary.

Between August 1979, when the Cheatham clinic opened, and December 1981, the number of patient visits grew an average of 16 percent yearly. After the first year of operation, the physician staff was in-

Table 2. New and return patients, percentage on Medicaid and Medicare, changes in visits per year, and revenues generated, by primary care clinic in the Goodlark network

Clinics	Total patients registered	New and return patients per week	Percentage of patients on—		Change in patient visits per year			Revenues generated
			Medicaid	Medicare	New patients	Return patients	All patients	
Cheatham Health Care Center (Aug. 1979–Dec. 1981) . . .	11,744	280	5.0	4.1	+69%	+13%	+16%	\$539,722
McEwen Clinic (May 1979–Dec. 1981) . . .	854	12	5.3	9.6	–38%	+10%	–19%	19,624
White Bluff Clinic (Jan. 1979–Dec. 1981) . . .	2,235	20	5.7	3.7	–22%	–16%	–19%	42,026
Fairview Clinic (Jan.–Dec. 1979) . . . . .	1,363	52	10.2	2.0	–25%	–17%	–60%	15,662

creased from two to three, and operating hours were increased from 40 to 68 per week. By the end of the second year of operation, the Cheatham clinic was generating revenue sufficient to subsidize other clinics in the Goodlark network to the break-even point, allowing Federal funds to be discontinued.

By December 1981, at the end of 3 years of operation, the McEwen Clinic had registered 854 patients, of whom 5.3 percent were on Medicaid and 9.6 percent on Medicare. Some 12 patients per week were being treated in this clinic; however, the number of patient visits had declined an average of 19 percent yearly over the 3 years, or 57 percent overall.

Between January 1979 and December 1981, the White Bluff Clinic attained a census of 2,235 patients, of whom 5.7 percent were on Medicaid and 3.7 percent were on Medicare. As in the case of the McEwen Clinic, however, there had been a continuing decline in the number of patient visits that averaged 19 percent per year. White Bluff shares a nurse practitioner with McEwen Clinic. During the period of this report, she saw an average of 20 patients at both clinics per week, generating revenues for her services equal to approximately 75 percent of her salary.

By the end of its only year of operation, Fairview Clinic had registered 1,363 patients, of whom 10.2 percent were on Medicaid and 2 percent were on Medicare. New- and return-patient visits averaged 52 per week over the year; however, by the end of 1979 the number of visits each week had declined precipitously. It was clear that local citizens were not using the Fairview Clinic because of their resistance to the planned phaseout of the State health department clinic with which Fairview Clinic had been sharing space. The Fairview Clinic was therefore closed.

By the end of December 1981, the Dickson Clinic had enrolled a total of 50 patients in its diet counseling and weight reduction activities. Patients in this part of the clinic's program were seen for periods of 2 weeks to 8 months, and a maximum of 20 patients were followed at any one time. The clinic's health screening activities initially involved some 50 to 80 examinations per month; however, this number decreased to a handful over time, despite notices in hospital lobbies about the availability of health screening and solicitation of area businesses to arrange screening for employees.

In September 1981, a questionnaire (fig. 2) was mailed from the Goodlark central billing office to a random sample of 110 recent, non-Medicaid patients with nondelinquent accounts, in an effort to

Figure 2. Goodlark patient survey

PLEASE DO NOT PUT YOUR NAME OR ANY IDENTIFYING MARKS ON THIS PAPER.

- 1) Male \_\_\_\_\_  
Female \_\_\_\_\_
- 2) When were you in the clinic?  
Day \_\_\_\_\_ Time \_\_\_\_\_
- 3) Was the waiting room clean? Yes \_\_\_\_\_ No \_\_\_\_\_
- 4) How long did you have to wait to see the doctor or nurse practitioner?  
Less than 15 minutes \_\_\_\_\_  
15 to 30 minutes \_\_\_\_\_  
30 minutes to 1 hour \_\_\_\_\_  
1 hour to 1½ hours \_\_\_\_\_  
1½ hours to 2 hours \_\_\_\_\_  
More than 2 hours \_\_\_\_\_
- 5) Was the examining room clean? Yes \_\_\_\_\_ No \_\_\_\_\_
- 6) Was your blood pressure taken? Yes \_\_\_\_\_ No \_\_\_\_\_
- 7) Was your height and weight taken? Yes \_\_\_\_\_ No \_\_\_\_\_
- 8) In general, was the treatment at the reception desk:  
Excellent \_\_\_\_\_  
Good \_\_\_\_\_  
Fair \_\_\_\_\_  
Poor \_\_\_\_\_
- 9) In general, was treatment by the office nurse:  
Excellent \_\_\_\_\_  
Good \_\_\_\_\_  
Fair \_\_\_\_\_  
Poor \_\_\_\_\_
- 10) In general, was the treatment from the doctor or nurse practitioner:  
Excellent \_\_\_\_\_  
Good \_\_\_\_\_  
Fair \_\_\_\_\_  
Poor \_\_\_\_\_
- 11) How would you rate the overall service at the clinic:  
Excellent \_\_\_\_\_  
Good \_\_\_\_\_  
Fair \_\_\_\_\_  
Poor \_\_\_\_\_
- 12) If any of your answers were "Fair" or "Poor" please tell us why.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

gauge patient satisfaction and community reaction to the clinics (excluding Fairview, which had closed). Responses were to be anonymous and returned by mail.

Fifty-six (51 percent) of the questionnaires were returned, with remarkably similar responses from patients of all clinics. Ninety-four percent of the respondents rated overall satisfaction with the clinics and the health care provider who had treated them as "good" or "excellent." Physicians and nurse practitioners were equally appreciated. Eighty-seven percent of the respondents reported a waiting-room time of 30 minutes or less, and 57 percent reported a wait less than 15 minutes. Subjective comments indicated satisfaction with convenience of the clinic location and hours of operation, with the clinic staff's ability to accept new patients and see them readily, and with pleasant surroundings and encounters with staff.

## Discussion

Several inferences can be drawn from the experience reported here with respect to use of health serv-

ices by patients, factors influencing the success of a health care facility, patient satisfaction, the effectiveness of nurse practitioners, and attitudes of patients toward health maintenance and preventive care.

The Middle Tennessee area has a rapidly growing population and a relative lack of health resources, compared with the national average. Patients appreciate and use primary health care centers located close to them, as evidenced by the number of patients registered in our clinics, compared with the size of the local population. For each of the Goodlark primary care clinics, the patient census was equal in number to more than 50 percent of the local population.

Many patients have told us that they use the Goodlark clinics as a matter of convenience while retaining a physician at a larger center—usually Dickson or Nashville—for more comprehensive services or hospitalization, which they may seek without our referral.

Patients' attitudes toward the use of health care services are multidimensional and complex; simple demand-and-supply factors do not fully explain them. In studying patients' choices among health care providers, others have noted that a significant number of health care shoppers who had been seen by their acknowledged primary physicians consulted additional physicians during the same year (5,6). Explanations given for this behavior are many. Some patients (often those who are younger, more hypochondriacal, or more negativistic) give subjective reasons related to their attitudes toward the medical profession—attitudes that may lead them to seek duplication of services already provided. Other patients give more objective reasons, such as need to obtain comprehensive care elsewhere because some medical services are not available locally.

Unlike the other primary care clinics in the Goodlark network, Cheatham Health Care Center has continued to expand its operations. The center has also experienced a continuing increase in both new and return-patient visits. Building the clinic on an established physician's practice and retaining the physician has undoubtedly contributed to the vitality of the enterprise. Another factor in the Cheatham clinic's success may be its ability to offer more comprehensive care and laboratory evaluation.

The gradual reduction in patient visits at McEwen and White Bluff clinics is worrisome. The proximity of McEwen to Waverly and Dickson, and of White Bluff to Dickson and Nashville, may have prompted some patients to travel to these other centers for more comprehensive care. Other factors in

*'Attempts to make the Goodlark clinics responsive to users' needs with respect to hours of operation and fee adjustment, the use of local residents as clinic workers, and cooperation and coordination with other area health resources and physicians are probably additional factors in acceptance by the local population.'*

the decline in patient visits may have been these clinics' limited hours of operation (20 per week) and limited facilities. Many patients who were referred to larger centers for treatment were undoubtedly lost to the Goodlark rural system, since most patients live within a 40-mile radius of a larger health center. Economic factors may also have played a part: families may forgo medical attention for self-limited illnesses during recessionary periods.

Whether the McEwen and White Bluff clinic populations will stabilize is not known at present. Plans for these clinics include expanding their hours of operation from 20 to 40 per week, increasing the number of hours when a physician is present, and providing more comprehensive services, along the lines of the successful Cheatham model.

The Fairview Clinic experience illustrates that attempting to take over an existing operation can be fraught with difficulties. At this clinic, patient visits declined precipitously, and patients who came did not form lasting relationships with the clinic. Ensuring that a new medical venture complements existing patterns of health care would appear to be an important feature of sound health planning.

Closely related to patients' continuing use of health care resources is their degree of satisfaction with treatment received. The results of our limited sampling of the Goodlark network's patient population appear to agree with previously reported patient satisfaction with neighborhood health care (5). Responses to the Goodlark questionnaire indicate that major determinants of satisfaction include convenience of the health resource, the patient's perception of courteous attention and understanding, and fulfillment of the patient's expectations concerning treatment of his or her medical complaints (7,8). Attempts to make the Goodlark clinics responsive to users' needs with respect to hours of operation and

fee adjustment, the use of local residents as clinic workers, and cooperation and coordination with other area health resources and physicians are probably additional factors in acceptance by the local population. In addition, the Goodlark physicians and nurse practitioners have been active in community health education programs.

The low number of Medicaid and Medicare patients in the Goodlark network's patient population may mean that these groups continue to receive little health care. Anecdotally, this impression seems true, since our Medicaid and Medicare patients rarely report that they have seen a physician recently; however, we have no data to resolve this question. One other possible explanation for the relatively small number of Medicaid patients treated in our clinics, in comparison with county poverty rates, may be the temporary nature of Medicaid eligibility. Thus the number of Medicaid-eligible patients seen in a medical facility may be a poor indicator of the prevalence of medical indigence among the local population.

Our highly satisfactory experience with the use of nurse practitioners reinforces other such experiences reported in the literature (9-11). In the Goodlark clinics, the nurse practitioners were well received by the patients, handled a case load of 20 to 30 patients per week (depending on clinic size), and generated revenue in payment for their services that approximated 75 to 100 percent of their salaries. Our experience has shown that in a small rural clinic nurse practitioners can provide needed services at lower cost to the clinic than can physicians seeing the same number of patients.

The experience of the Dickson Clinic with health screening, weight control, and diet counseling illustrates the problems inherent in offering these services. Indeed, there are differing opinions about the efficiency and cost effectiveness of screening asymptomatic patients except in selected instances (12-17). In weight reduction programs, obesity may be influenced by a combination of behavioral, educational, and environmental manipulations (18). A motivated patient is a prerequisite in dealing with obesity, and a single, predominantly educational approach may not work for every patient. Current plans for the Dickson Clinic include offering the Health Evaluation and Reassurance Test program to area physicians as an aid in the evaluation of new patients and offering diet counseling to patients these physicians refer to the clinic.

Overall, our experience with the Goodlark system points up the fact that health planners must take

into consideration local community factors and previous patterns of health care in an area if a new system is to complement existing resources. This experience with a rural health care network in Middle Tennessee may be worthy of consideration by health planners in other localities.

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## The Frequency of Complications in Cesarean and Noncesarean Deliveries, 1970 and 1978

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### SYNOPSIS .....

*National Hospital Discharge Survey data, collected by the National Center for Health Statistics, were*

*used to examine complications associated with cesarean and noncesarean deliveries in the years 1970 and 1978. Cesarean deliveries comprised 5.5 percent of all deliveries in 1970 and 15.2 percent in 1978. Two-thirds (68.4 percent) of the 1970 and 82.1 percent of the 1978 cesarean deliveries involved specified complications compared with only 14.6 percent of the 1970 vaginal deliveries and 17.8 percent of the 1978 vaginal deliveries. More than one-fourth of the 1970 and 1978 cesarean deliveries, but less than 1 percent of the vaginal deliveries, were preceded by a cesarean section delivery. From 1970 to 1978, there was both a rise in breech presentations and a shift toward surgical management of them. Also, cesarean deliveries were associated with placenta previa, fetopelvic disproportion, prolonged labor, and premature rupture of membranes. Several competing explanations have been offered for the rise in complication rates and in cesarean delivery rates.*

**A** DRAMATIC OBSTETRICAL CHANGE in the United States has been the recent rise in the incidence of cesarean delivery, which by 1981 was the mode of delivery for 17.9 percent of all hospital deliveries. Consequently, there is increasing concern about what the maternal and infant indications for cesarean delivery are as compared with nonsurgical delivery. The study described here was undertaken to compare the frequency of complications of delivery in 1970, when the cesarean delivery rate was low, with these indications in 1978, when this rate was three times higher. The authors of a number of studies have reported an increased rate of cesarean births, discussed reasons for the rising rate, and identified some of the associated health conditions. Few investigators, however, have combined all three approaches. In our study, we examined the change in the rates of complications in delivery between two points in time with reference to the reasons for the change.

### Study Methods

The National Center for Health Statistics collects data annually on discharges from short-stay hospitals

in the National Hospital Discharge Survey (NHDS). Information for the NHDS is abstracted from the face sheets of medical records, which are selected from inpatients discharged from a national sample of non-Federal general and special short-stay hospitals. Roughly 200,000 medical records are selected annually from the approximately 400 hospitals that participate in the survey, although the sampling numbers and fractions vary from year to year. A more detailed report on the design of the NHDS has been published (1). The statistics in our report are based on NHDS sample data from mothers' hospital discharge records and are "weighted up" to reflect national estimates. The numbers upon which the rates and percentages in the tables are based represent an unduplicated count of the women whose pregnancies resulted in either a live birth or a fetal death, numbers which compare well with U.S. vital statistics data on the numbers of deliveries.

The numbers and percentages of deliveries involving specified maternal and infant conditions are based on the Eighth Revision of the International Classification of Diseases (ICDA-8). There was a shift in 1979 from classifying diseases by the ICDA-